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AUTHORS: Kot, M. V., and Maronchuk, Yu. Ye.

TITLE: Some electric properties of thin cadmium telluride films

SOURCE: Kishinev. Universitet. Uchenyye zapiski. v. 49, 1961, 78-85

TEXT: To arrive at the best conditions for producing films their electric, optical and photoelectric properties were determined. The films were produced by evaporating Cd and Te from tungsten and condensing onto cold or hot glass backings. Their physical properties depended greatly on the Cd-Te concentration ratio. Pure Cd and Te have the same conductivity in bulk and as a film whereas any mixture has a lower one, and the 50:50 concentration shows minimum conductivity. The type of conductivity depends both on concentration and on temperature. Hence the stoichiometric composition is p-type at room temperature and n-type above that. Since annealing is attended by an ordering process, annealing in vacuo irreversibly changes the conductivity. InSb sublimation tests carried out with a backing separated into stripes 4 mm wide showed that at 250°C the excess Cd is almost completely sublimated, and at 350°C the

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excess Te. Another series of experiments was made with InSb films from sublimation of InSb single crystals made by Bridgman's method. Pure polycrystals, too, were used for this purpose. The layers were furnished with ohmic contacts of aquadag or gold in order to measure  $\sigma(T)$ ,  $\sigma(d)$ , the volt-ampere characteristics and the potential distributions. Results: Sublimated CdTe does not dissociate; when deposited on a base of 20°C its structure is unstable. Stability can be reached when the base is heated above 250°C; films deposited on a hot base are always p-type. The increase of  $\sigma$  when  $d$  is reduced from 0.5 to 0.2  $\mu$  is attributed to sorption of air. Silver-doped CdTe films are p-type, indium-doped films are n-type. The InSb films produced had the same properties as the bulk material. The forbidden-band width, determined from  $\sigma(T)$ , was 1.45-1.5 ev. There are 5 figures.